

CLAIMS

- 1 1. A process for the preparation of lower alkyl 4-cyano-3-hydroxybutyrate (ACHB)
2 which process comprises in combination:
3 (a) reacting 3-hydroxy- γ -butyrolactone using a haliding reagent in the
4 presence of an acylating agent in a lower alkanol solvent so as to provide a
5 reaction product comprising lower alkyl 4-halo-3-hydroxybutyrate wherein said
6 halo is selected from bromo and iodo and
7 (b) reacting the reaction product from step (a), without isolation or
8 purification, with a source of cyanide ion in a reaction mixture having a pH in the
9 range of 7 to 11 to produce lower alkyl 4-cyano-3-hydroxybutyrate (ACHB) with
10 minimal side reaction products.
- 1 2. The process of claim 1 wherein said haliding reagent in step (a) is selected from
2 the group consisting of hydrogen bromide in solution or gaseous form, hydrogen
3 iodide, acyl halide, trimethylsilyl halide and an alkali metal halide, wherein such
4 halide is selected from bromide and iodide.
- 1 3. The process of claim 2 wherein said haliding reagent is liquid hydrogen bromide.
- 1 4. The process of claim 1 wherein said acylating agent in step (a) is selected from the
2 group consisting of lower alkanoyl halides, lower alkanoic anhydrides, lower
3 alkyl alkanoates and mixtures thereof.
- 1 5. The process of claim 4 wherein said acylating agent is acetyl chloride.
- 1 6. The process of claim 4 wherein said acylating agent is acetic anhydride.
- 1 7. The process of claim 4 wherein said acylating agent is ethyl acetate or ethyl
2 formate.
- 1 8. The process of claim 1 wherein acetyl bromide serves as said haliding reagent and
2 as said acylating agent.
- 1 9. The process of claim 1 wherein said source of cyanide ion in step (b) is an alkali
2 metal cyanide.
- 1 10. The process of claim 9 wherein said alkali metal cyanide is sodium cyanide.

- 1 11. The process of claim 1 wherein said step (a) and said step (b) are carried out
2 sequentially in a single reaction vessel.
- 1 12. The process of claim 1 wherein said process employs racemic reactants and
2 produces a racemic product.
- 1 13. The process of claim 1 wherein said process employs optically active reactants
2 and produces a optically active product.
- 1 14. The process of claim 13 wherein said process employs reactants having the (S)
2 configuration.
- 1 15. The process of claim 1 wherein said reaction product of step (a) is ethyl 4-bromo-
2 3-hydroxybutyrate (EBHB) and the final product produced is ethyl 4-cyano-3-
3 hydroxybutyrate (ECHB).
- 1 16. The process of claim 1 wherein process step (b) is carried out at a pH in the range
2 of 8 to 9.5.
- 1 17. The process of claim 1 wherein process step (b) is carried out in aqueous ethanol.